

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

ADEQUATE RECORDS are necessary to the efficient management of any business. The farmer, to be successful, must be a business man as well as a grower of crops and producer of live stock. As a business man he should have suitable business records.

Farmers, as a rule, are highly individualistic in their methods, and farm business conditions vary widely. Accordingly, ready-made systems of farm accounts seldom bring out all the facts that the farmer ought to know. Systems must be developed to fit each man's requirements, and efforts to shape one's needs according to a prepared system not based primarily on these needs will almost inevitably result in failure.

Getting a knowledge of accounting principles is the first and most important step toward establishing an accounting system suited to one's individual needs. There are many degrees in farm accounting, from the simple to the extended and complex, but it is obviously impossible to discuss them all in a single bulletin. It is the purpose of this bulletin merely to outline the principles of simple farm bookkeeping.

Office of the Secretary
Contribution from the Office of Farm Management
H. C. TAYLOR, Chief
Issued October, 1912; revised, June, 1920
Washington, D. C.

FARM BOOKKEEPING.

EDWARD H. THOMSON

Formerly Assistant Chief, Office of Farm Management.

Revised by

JAMES S. BALL

Assistant in Farm Accounting.

CONTENTS.

	Page.		Page.
Comparison of commercial and farm bookkeeping	4	Determining net farm income and net farm profit.....	34
Impersonal character of business....	5	Interpretation and use of farm accounts	37
Application of double-entry principle..	6	Conclusion	39
Types of farm records.....	7	Selected list of references on farm business analysis.....	40
The farm inventory.....	10		
Financial accounts	20		

FARMING IS A BUSINESS, and, to be successful, it must be conducted in a businesslike manner. It involves the production and sale of commodities, just as does manufacturing. The business man, whether in factory or on farm, should be constantly considering two questions:

- (1) What profit is my business making?
- (2) How can that profit be increased?

The first of these must be answered before an intelligent effort can be made to answer the second. Proper accounting leads directly to the answer to the first question, and hence it is essential to any well-thought-out plan to increase profits.

The problem of the farmer is to meet conditions on his own farm in a way that will give him the greatest net returns, year in and year out, for the use of his capital, his labor, and his managerial ability. Before he can be considered a successful farm operator he must produce results that will cover the value of all these. Capital can earn interest without labor on the part of its owner, and labor can earn wages without owning any capital. The farmer, utilizing both in the conduct of his business, should secure returns that will cover both interest and wages. Not until both of these have been more than covered can any profit be credited to the farming operations. Nothing but return in excess of interest and wages can properly be considered as net profit.

There is reason to believe that many farmers, owing to a lack of proper records, do not know what returns they actually receive, nor how these compare with what they should receive for their work and

the use of their capital. Doubtless many are living on the interest on their capital, making small wages or none, and no net profits.

A very large number of farm problems have been solved by the experience of farmers—far more, in fact, than have been worked out in any other way. There are some problems, however, that have not been solved in this manner. The problem of farm architecture and that of farm accounting are two of these. One reason for this is that much of the instruction the farmer has had on these two subjects has been misleading. As in architecture, so in accounting, the main work that has been done has related to city conditions and is not applicable to conditions on the farm. Most farmers who have tried to keep books have used the systems of city bookkeepers, which are not adapted to farm accounting. Even where these systems have been modified in the attempt to meet farm needs, they have usually failed to meet the farmer's requirements.

The difference between bookkeeping and cost accounting should be definitely understood. Bookkeeping is the keeping of records that will set forth the income, cost, and profit of the business as a whole or complete unit; cost accounting involves the finding of cost, returns, and profit on production units—on a pound of beef, a quart of milk, a bushel of grain, etc.

This bulletin has not been prepared to present any particular systems of accounts for farm use,¹ but is rather a discussion of some of the important principles that are applicable to bookkeeping on the farm. It is believed that the farmer who studies it sufficiently to grasp these principles will be enabled to select or devise a system that will be adequate for his particular needs.

COMPARISON OF COMMERCIAL AND FARM BOOK-KEEPING.

In commercial bookkeeping, which has been a subject of study and in process of standardization through several centuries, systems of bookkeeping have been developed which fulfill the needs and requirements of a great majority of merchants. Moreover, in the world of commercial affairs there is considerable similarity in these needs and requirements.

In farm bookkeeping these conditions do not exist. Not only do peculiar conditions occur on almost every farm as to the type of business, size, and opportunities and facilities for record keeping, rendering it difficult to apply a uniform system prepared for use under entirely dissimilar conditions, but the subject of farm book-

¹ Farmers' Bulletins 572 and 782, entitled "A System of Farm Cost Accounting" and "The Use of a Diary for Farm Accounts," respectively, present two more or less standardized systems of farm accounting.

keeping has received little or no attention until the last few decades, and consequently little progress has been made toward the desired end.

Farm bookkeeping principles, however, apply at all times and on all farms, and when these are thoroughly understood and all conditions studied, the development of a proper system to fit these conditions can be taken up with every probability of success.

IMPERSONAL CHARACTER OF BUSINESS.

In order to understand bookkeeping principles, the business should be considered as entirely separate from the individual owning the business. That is, in all relations between it and its owner the records should be handled exactly as if business and owner were two persons. The necessity of this relation is fully recognized in the commercial world, and lack of comprehension of it is one of the causes which prevent many farmers from fully understanding the principles of accounting. The merchant rarely takes goods from his store for his personal use without charging them to his own personal account, just as though they were sold to any other customer. He is usually fully aware that otherwise it would be impossible for him to know the actual state of his business affairs. On the other hand, the farmer ordinarily devotes the property of his business to a considerable extent to his own personal uses without a thought as to the accounting consequences, and as a result may get a false idea of the results of his farming operations when he balances his accounts.

On the farm, where the personal affairs of the owner, his household, and the farm affairs proper are interwoven, this point of view is admittedly difficult to acquire, but nevertheless it is very necessary to acquire it.

In order to carry out this idea it is a good plan to consider the general funds received for farm products as belonging to the farm, and for the owner to maintain a separate purse for his personal requirements, refilling it from time to time from the farm funds, and charging his personal account on the farm books with the amounts so used. This idea, as is explained elsewhere in this bulletin, may be carried a step further by establishing a separate purse for the household expenses, allowing the housekeeper a certain amount weekly or monthly on which to run the house. Such practices are well calculated to give a man a good perspective of the relations existing between the finances of the farm, the household, and himself, and are more generally satisfactory to all concerned than the common practice of having a single purse for all these purposes.

APPLICATION OF DOUBLE-ENTRY PRINCIPLE.

While it is true that success in farm accounting is not a matter of forms or blanks, but one of using well-defined principles, the double-entry idea can not be lightly disposed of, as some writers on farm accounting have tried to do, by stating that it is a mere matter of form. It can not be stated too positively that double entry is not simply a form of bookkeeping. It is an indispensable feature of correct accounting.

Briefly stated, this principle is based on the fact that every business transaction has, for each party involved, two distinct sides. One value is *acquired*, another is *surrendered*. For instance, a person selling a horse acquires cash value and surrenders horse value. If the horse is sold on credit to John Smith, account value (the fact that John Smith owes this value) is acquired instead of cash value. When he pays for the horse, cash value is acquired and account value (he no longer owes anything) is surrendered. If the records do not take account of both sides of each transaction they will not show the facts, and will, therefore, be misleading, and worse than useless.

Violations of this principle are common, and lead to the most erroneous conclusions in farm cost accounting. Carrying the value of manure as a credit to the cattle account and not charging this same value to the crop accounts is an example of a common way in which this principle is violated, and many other instances might be cited. No matter what the transaction, this principle holds good and should never be violated.

In the case of cash transactions where a cashbook is used, the double-entry principle is automatically followed. Entering the money received and giving the description of what was sold for it, charges the cash account with the value on the one hand, while the crediting of the proper account with the value of the thing sold completes the "double entry."

RULES FOR DETERMINING CHARGES AND CREDITS.

As a usual thing it will not be found difficult to determine for each transaction which account to charge and which to credit. The general rule may be briefly stated thus:

Charge that account which acquires the value.

Credit that account which surrenders the value.

Where strictly cash accounts are kept little trouble will be experienced, as all cash received is *acquired* and by the rule is a charge to cash, while the corresponding credit is carried to the account which *surrendered* the value for which cash was received, and vice versa.

As elsewhere explained, this is automatically performed in a simple account of cash receipts and expenditures.

A more difficult problem comes up in determining when to charge an expenditure of cash to expense and when to investment (purchase) accounts. Also it is sometimes hard to tell when to credit a receipt to an income and when to an investment account. The rules in this regard are almost as simple as the foregoing, and may be stated briefly as follows (examples given below):

(1) Charge to expense accounts all those things which will be consumed as soon as used.

(2) Charge to investment accounts those things which will be used over and over again in the course of the farm business or which are bought for resale in the regular course of the business.

(3) Credit to investment accounts receipts from sales of articles which have formed part of the farm equipment or permanent plant.

(4) Credit to income accounts all receipts for products of the farm or for things incidental to such production.

(5) Credit to expense accounts all receipts for expense *rebates* and for things previously charged to expense accounts.

Examples of items falling within the scope of the foregoing rules are:

Rule 1: Seed, twine, feeds, wages, etc., parts for machinery, building repairs.

Rule 2: Work stock, cows for the dairy herd, breeding animals, machines, drain tile, fencing, etc., and animals bought for fattening and resale.

Rule 3: Old machinery and machinery junk, old lumber, work stock, animals from the permanent herds, etc.

Rule 4: Milk, eggs, crops raised and sold, market live stock, etc., and receipts for labor and machine work done by farm labor.

Rule 5: Feed bags; surplus purchased feed, seed, and twine; spare machine parts sold, etc.

While the foregoing rules will doubtless prove of assistance in analyzing transactions to determine the proper charges and credits, there will sometimes occur transactions which seem to fall within what may be called the "twilight zone" between two rules. In such cases good judgment alone must be relied on, as no set of rules will cover all cases.

TYPES OF FARM RECORDS.

Farm records may vary from the taking of an annual inventory to carrying the most complete and detailed system of cost accounts. The following outline illustrates three types of farm accounting from the simplest to the most complex.

Outline of types of farm records.

Type.	Records necessary.	Information that may be obtained.
I. Property record....	1. Inventories made once a year.	1. Investment in each kind of farm property and net worth of the farm as a whole. 2. Increase or decrease in net worth during the year.
II. Farm bookkeeping. (Accounts with the farm as a unit.)	1. Inventories made once a year. 2. Financial records. 3. Value of supplies furnished by the farm to the family. 4. Value of board furnished by family to paid farm laborers. 5. Unpaid family labor devoted to farm work.	1. Investment in each kind of farm property and net worth of the farm as a whole. 2. Increase or decrease in net worth during the year. 3. Classified summary of farm receipts and expenditures. 4. Farm income. 5. Net farm profit. 6. Household and personal expenses. 7. Value of food, fuel, and use of house furnished by farm to family.
III. Farm cost accounts. (Accounts with the farm and with each farm product and department as a separate unit.)	1. Inventories made once a year. 2. Financial records. 3. Value of supplies furnished by the farm to the family. 4. Value of board furnished by family to paid farm laborers. 5. Value of other perquisites furnished by farm to paid farm laborers. 6. Unpaid family labor devoted to farm work. 7. Labor record. 8. Feed records. 9. Livestock production records. 10. Crop supply and yield records.	1. Investment in each kind of farm property and net worth of farm business as a whole. 2. Increase or decrease in net worth during the year. 3. Classified summary of farm receipts and expenditures. 4. Farm income. 5. Net farm profit. 6. Household and personal expenses. 7. Value of food, fuel, and use of house furnished by farm to family. 8. Cost per hour of man labor. 9. Cost per hour of horse labor. 10. Complete distribution of all costs. 11. Complete distribution of all income. 12. Complete allocation of all profits and losses. 13. Cost of production in each department. 14. Margin between cost and market value. 15. Efficiency factors in farm management.

PROPERTY RECORD.

The first type includes only the farm inventories made once each year and is valuable as a means of determining the value of the farm property and of showing whether the farmer has made progress in a financial way during the year or whether he has gone back. It measures only the amount of this progress or going backward. It is well to emphasize this point. The increase or decrease in net worth does not represent the profit or loss on the farm business, since it is affected by the affairs of the farm family. If one knew the amount of the household and personal expenses, the value of the unpaid farm labor of the family, and also the value of the interrelated transactions between the farm and the family (see Type II, Nos. 3 and 4), it would be possible to determine, from these data and the inventories, the actual farm income.

For instance, if the cash expenditures for household and personal purposes were \$606.85, the personal income \$14, the value of the interrelated items 3 and 4, \$677.74 and \$60 respectively, and the value of the family labor, \$110, the following calculation would disclose the actual farm income:

Net inventory increase-----		\$155.36	
Add:			
Household and personal cash expense-----	\$606.85		
Value of supplies furnished family-----	677.74	1,284.59	
			\$1,439.95
Subtract:			
Value of board furnished by family-----	60.00		
Value of unpaid family farm labor-----	110.00		
Personal income-----	14.00		
			184.00
Balance (represents income from farm)-----			1,255.95

Briefly put, to find the farm gain it is necessary to add to the increase in inventory value the value of those things furnished to the family by the farm and to subtract the values furnished to the farm by the family.

In order to determine the net farm profit, the sum of the interest on the farm capital and the value of the farmer's time must be deducted from the farm income, as will be explained further on.

In this computation must be taken into account the amount of income, if any, from personal or nonfarm sources. Dividends or interest received from outside investments, jury and witness fees, and gifts of money received are common examples of such items. The amount of personal income should be included in the items to be subtracted from the amount of inventory increase, if this amount has been included in the general purse, and therefore takes the nature of supplies (cash) furnished by the family (which includes the farmer) to the farm.

FARM BOOKKEEPING.

The second type comprises the inventories, financial records, and records of interrelated values. Financial accounts are more generally kept by farmers than any other kind of records. Many farmers, however, after keeping financial accounts for a year, find they can get little valuable information from them in return for the time and attention devoted to them. This is because they have no inventory records. The inventories are just as necessary for the proper and intelligent interpretation and understanding of the financial accounts as are the financial accounts themselves. They are the milestones of business, corresponding to the balance sheets of banks and other commercial and manufacturing concerns, and are always necessary, no matter what other accounts are kept.

FARM COST ACCOUNTS.

The third type represents all the records necessary to complete farm cost accounts, which, if successfully carried out, will give the actual, as well as the relative, cost and profit on all the farm enter-

prises as well as other valuable data. Cost records can be obtained only by the outlay of much time and close attention to detail. A man who works hard all day at manual labor rarely has either time or inclination to spend much of his leisure time in this work. Only when the conditions seem to warrant the assumption that the accounts will be carried through to a successful end should they be attempted. While this bulletin, in a general way, touches upon some of the principles applicable to farm cost accounts, it is concerned in the main with a discussion of the records contained in type II.

THE FARM INVENTORY.

The term "inventory" is used to designate a list of property and property values. As has been previously pointed out, the annual farm inventory is a sort of guide or mile-post which indicates to a farmer just how he stands, financially, year by year. Without it no other records can be correctly interpreted.

A farm inventory is simply a statement showing what land, buildings, live stock, produce, supplies, etc., are owned and what they are worth at the time the inventory is taken. It shows also the amount of cash on hand and the amounts owed or owing at that date. It is a list of farm property and farm debts. To be of the greatest value it should be itemized to show separately what the farm is worth, the value of each head or group of live stock, the value of each machine or tool, the products for sale or feed, the materials and supplies on hand, the amounts owing by the farm, and the amount of cash on hand or in the bank. It must also show, under "Liabilities," the amounts of all debts the farmer owes other people. Table I exhibits a good sample of a farm inventory. It will be noted that it is divided into several parts or divisions as has been previously recommended.

TABLE I.—*Sample of a farm inventory, showing in a general way how this valuable record is prepared.*

Divisions and items of property.	April 1, 1918.			April 1, 1919.		
	Quantity.	Value per unit.	Valuation.	Quantity.	Value per unit.	Valuation.
REAL ESTATE:						
Land and improvements.....acres.....	120	\$80	\$9,600.00	120	\$80	\$9,600.00
LIVE STOCK:						
Cows, dry and in milk.....	1	125	125.00	1	100	100.00
Heifers.....	1	40	40.00	2	60	120.00
Calves.....	2	30	60.00	4	25	100.00
Steers.....	1	115	115.00			
Total cattle.....			340.00			320.00
Horses—						
Jim, 12 years old.....			200.00			175.00
Jack, 14 years old.....			175.00			160.00
Jen, 8 years old.....			225.00			225.00
Jess, 20 years old.....			35.00			Died.
Total horses.....			635.00			560.00

TABLE I.—Sample of a farm inventory, etc.—Continued.

Divisions and items of property.	April 1, 1918.			April 1, 1919.		
	Quantity.	Value per unit.	Valuation.	Quantity.	Value per unit.	Valuation.
LIVE STOCK—Continued.						
Swine—						
Brood sows.....	1	\$75	\$75.00	7	\$60	\$420.00
Boar.....				1	45	45.00
Pigs.....	3	20	60.00	24	6	144.00
Total swine.....			135.00			609.00
Poultry.....	50	1.50	75.00	62	2	124.00
Total live stock.....			1,185.00			1,613.00
MACHINERY AND TOOLS:						
Plows, walking, 12-inch.....	2	10	20.00	2	8	16.00
Plows, sulky, 16-inch.....	2	75	150.00	1	65	65.00
Disk harrow, double, 8-foot.....	1	20	20.00	1	17	17.00
[All items listed but not shown here].....						
Total machinery and tools.....			1,633.50			1,498.25
FARM PRODUCE:						
Barley.....bushels..	32	2	64.00	124	1.50	186.00
Oats.....do.....	284	1	284.00	302	.80	241.60
Corn, ear.....do.....	30	1	30.00	50	.75	37.50
Buckwheat.....do.....	17	1	17.00	20½	1.50	30.50
Hay.....tons.....	11	23	253.00	15	20.00	300.00
Total farm produce.....			648.00			795.60
PURCHASED FEEDS AND SUPPLIES:						
Bran.....pounds..	100	.03½	3.50	250	.03½	8.75
Shorts.....do.....	50	.03½	1.88			
Lime.....tons.....				5	6.00	30.00
Fence posts.....				50	35	17.50
Grain bags.....	22	10	2.20	12	10	1.20
Total feed and supplies.....			7.58			57.45
NOTES AND ACCOUNTS:						
Harry Smith, note for cow.....			100.00			
George Jones, for corn.....			42.00			
John Williams, for corn.....						63.00
Henry Robinson, for work.....						5.00
Total notes and accounts.....			142.00			68.00
CASH ON HAND AND IN BANK.			256.35			195.49
Total value of "assets" (property owned).....			13,472.43			13,827.79
NOTES AND ACCOUNTS OWING:						
Farm mortgage.....			4,000.00			4,000.00
Samuel Grey for hogs.....						200.00
Total "liabilities" (amounts owed).....			4,000.00			4,200.00
SUMMARY:						
Total assets.....			13,472.43			13,827.79
Total liabilities.....			4,000.00			4,200.00
Balance or "net worth".....			9,472.43			9,627.79
[Increase \$155.36 for the year.]						

DIVISIONS IN A FARM INVENTORY.

Real estate.—Under this heading are placed the farm land, buildings, fences, woodlots, and all items of land improvement, for the farm is thought of as embracing all of these in a single unit. If the farm is sold all of these go with it.

Live stock.—All the different classes are entered separately, as horses, cattle, hogs, poultry, and the like. Each class is itemized by individuals or subclasses as far as is practicable. Thus the total amount invested in horses or any other class of stock can be found for any year. In taking this part of the inventory each animal may be given a separate value, or some method may be followed that enables each individual or class to be recognized in taking the next inventory.

Machinery and tools.—This division contains the largest number of items to be listed, as this part of the equipment on a farm is always varied. In taking this part of the inventory it is important to use care not to overlook any item, for if certain implements are overlooked in one inventory and then included in the next, confusion and inaccuracy result. If carefully taken and each item listed separately, a machinery and tool inventory will fill several pages of a good-sized book. If such detail is not desired, the minor tools of small value may be grouped in a single item and a lump valuation given, but such a course is not advisable. This part of the inventory, carefully made at the beginning and checked up each year, is a help in locating minor tools. It is surprising what a large number of these small tools there are on a farm, and what a considerable number disappear during a year. All farmers know how easy it is to lose a hammer or a wrench, but an old wagon never disappears.¹

Inventory day is a convenient time to call in all tools that have been loaned out. Small tools have a habit of changing owners if they remain away from home too long.

Produce, feed, and supplies.—Some items in these divisions are hard to estimate closely, as, for instance, the number of tons of hay, straw, and other produce in bulk,² but experience, conservatism, and good judgment will surmount this obstacle and give fairly accurate results.

Financial items.—This division includes all "book" items, sometimes known as "financial" or "intangible" items, as distinguished from the other items which are termed "physical" or "tangible" property. These consist of the cash on hand and in the bank and the amounts due the farm from others.

The sum of the property values embraced in the foregoing five divisions will be the value of the "assets" or property *owned*. This does not necessarily constitute the net worth, as the "liabilities" or amounts *owed* have not yet been listed, summed up, and deducted, so another division of the inventory should now be constructed to include these.

Liabilities.—Here should be listed the mortgage, notes, and accounts payable. When these are added and their sum subtracted from the total assets, the balance is known as the "net worth."

¹ Circular No. 44 of the Bureau of Plant Industry, entitled "Minor Articles of Farm Equipment," gives a very complete list of small tools found on farms.

² See Circular No. 67, entitled, "Measuring Hay in Ricks and Stacks."

HOUSEHOLD GOODS, ETC.

It must be understood that in the farm inventory no mention is to be made of the household furnishings or personal effects, as only the farm and its accessories are to be considered. While it is true that the dwelling has been included in the value of the farm, this is necessary, as it is a part of the real estate and would be included if the place were sold.

It will be noted in the inventory form shown in Table I that there is a column for the values on April 1 of one year and another for the corresponding values of the same items the following year. This idea is a convenient one and the idea can be carried further by providing an inventory book with columns for a number of years.

DETERMINING VALUES.

There are many and varied opinions on the question of how farm values should be determined. It has been suggested that the inventory value of a farm should be its original cost to its present owner. The objection to this is that one of the important purposes of making an inventory is to ascertain the actual worth of the property, which may be considerably greater, or in some cases much less, than its original cost. Then again, the farm may have been inherited by its present owner, and therefore may have cost him nothing.

Unusually high or speculative values should not be used, as they do not represent facts and only tend to deceive and mislead. The danger of overvaluing should be carefully guarded against, as no good can come from it, while considerable harm may. A good rule is to place the value of almost all the various permanent property items at what they could be sold for, not at forced sale, but under normal conditions. This method may seem incorrect in the case of real estate and permanent live stock, in that some may think it calculated to give too low values. The danger of placing values too low is not nearly so great as placing them too high and then finding, at some future date, that conditions did not warrant so high valuations. The exceptions to valuations by this rule are explained hereinafter.

When the inventory value of the farm land is advanced to keep pace with advancing land values, and not because improvements have been made in the course of the farm business, such increase should not be allowed to swell the farm profits for the year. In such cases care should be taken to exclude this appreciation in determining the farm profit, and this is best accomplished at the time the records are finally summarized as shown in Table X by deducting it from the ascertained net farm profit figure (\$202.25 in the table).

In appraising the values of market live stock and farm produce, market price should be used, always deducting therefrom a sum

sufficient to cover the cost of getting to market. Inasmuch as market prices vary from year to year these values may be low one year and high the next, or the opposite. It is impossible to ignore this sometimes troublesome fluctuation, but, in ordinary times, market changes are not extraordinarily great from one year to the same date a year later. However, it must be remembered that a man's worth does actually fluctuate with the market value of the property he owns. If no attention is given to market values a serious source of inaccuracy may be written into the records.

Purchased feeds and farm supplies should be valued at cost.

DEPRECIATION.

In the case of the property composing the permanent equipment of the farm or "farm plant," as it is sometimes called, just as factories are sometimes known as "manufacturing plants," the factor of depreciation must be considered. Few accurate figures as to depreciation of farm property are available. It is quite difficult accurately to gauge depreciation, since it depends on a number of factors which vary greatly in different sections of the country and even in the same section. A few suggestions will be made as to some of the principles affecting depreciation rates, but good judgment must be used, in every case, in applying them to definite conditions.

For ordinary frame farm buildings it is generally considered that 2 to 3 per cent per year will be a fair allowance. Brick, stone, tile, and concrete structures will not take so high a rate. Poorly built frame sheds and the like will require considerably higher allowances. It sometimes happens that the increase in farm-land values from year to year will more than offset the depreciation of buildings and other improvements. In other cases the growth of timber in a good farm woodlot will have a tendency to offset this loss. Of course, if farm cost accounts are being carried on, each of these increases would have to be shown as a separate gain, and depreciation as a loss, but in farm bookkeeping, which considers the whole farm as a unit, the loss and gain may simply offset each other. On many farms buildings are kept in such good repair that they depreciate very slowly, and the amount spent for maintenance each year may be considered as eliminating the necessity of allowing for depreciation, as the buildings, under these circumstances, will last almost indefinitely. Cases are not uncommon where frame buildings are in excellent shape after more than 100 years' use. This is also true in a measure of fences when built of the very best materials and properly maintained.

In the case of tile drains, the rate of depreciation may vary from a rather high to a very low rate, according to the quality of the tile, the care used in laying it, and in keeping the outlets open and protected from animals.

In valuing machinery and tools, market values do not consistently apply. It is well known that a machine depreciates in market value very rapidly the first year, or even the first month, used. That is, a mowing machine may cost \$75, but if it is used a month it becomes a secondhand machine, and it may be difficult to realize \$50 on it. The farmer buying new equipment may find the market value or sale price greatly reduced after one year's use, while the second and third year the value may not be further reduced appreciably. In other words, a mower that has been in use three years may sell for almost as much as one that has been used but three months. As the machinery equipment is part of the farm "plant," or the property necessary to the carrying on of the farm business, it should be valued at its value to the farm, and this value is not determined by secondhand machinery prices. It therefore becomes necessary to use somewhat arbitrary means of valuation. By dividing the original cost by the probable useful years of life an annual depreciation factor is determined, and by reducing the value each year by the amount of this factor the inventory value will be gradually decreased until at last it is entirely extinguished. By correcting this factor from time to time, this method will prove satisfactory in the general run of cases.

The number of years of useful life will depend on many factors. Among these are extent of use, climate, kind of machine, soil type, topography, and the care taken of the machines. Some farmers who take good care of their machines make them last much longer than machines owned by those who do not take care of them.

The rate of depreciation on farm machinery has been variously estimated at from 6 to 15 per cent. Where machinery is inventoried and valued in groups, or as a whole, the problem is simpler, but this method can not claim any great degree of accuracy. Mr. Grant G. Hitchings, a practical New York farmer who has given much attention to bookkeeping, uses the following method: He deducts 10 per cent from the first inventory value and to the remainder adds the cost of all new items bought during the year. Thus he figures the second inventory value. For instance, if his machinery was worth \$825 at the beginning of the year and during the year a new mower and hay rake were purchased for \$115, he would figure his machinery value for the inventory at the end of the year as follows:

Inventory value at the beginning of the year.....	\$825.00
Less 10 per cent.....	82.50
Remainder.....	742.50
Add cost of new machinery purchased.....	115.00
Inventory value at the end of the year.....	857.50

This method can not be expected to give a precise inventory value for all years, but when used over a long period the values should be fairly accurate. If it is found by experience that the rate is obviously too high or too low, a new inventory may be taken any year and the total amount corrected. This method is a practical way of handling the valuation of machinery but is not to be recommended in all cases, especially if cost accounts are being conducted.

The depreciation rates of the permanent live-stock herds should be based on careful appraisals made at inventory time each year. It is true that these appraisals will be based, in part at least, on estimated depreciation, which in turn will be based on original cost, estimated length of useful life, and sale value when useful or productive life is over. U. S. Department of Agriculture Bulletin 413 gives useful information on these points as to work horses and certain breeds of dairy cattle.

APPRECIATION.

Certain classes of farm property appreciate constantly up to a certain point. Such a piece of property is a good farm woodlot. The young stock of the permanent herds come also within this category, but the methods of valuation already explained cover these.

When growing orchards and other semipermanent crops are occupying part of the farm land, the increased value of the land carrying these must be taken into consideration when valuing the farm, and as these crops grow and approach maturity, thereby increasing in value year by year, it is necessary to take into account these increasing values at inventory time each year. This should never be based on estimated returns, as working on such a basis would be what is known as "overcapitalizing," or, as it is commonly called in the financial world, "watering stock." People are prone to wax enthusiastic over anticipation of profits from their ventures, and the result is likely to be "inflated" or highly overestimated values. It is best to stick to conservatism, and to base these values on the actual first cost of the plants or trees, plus cost of planting, and to increase the value from year to year, in proportion to the cost of maintenance until the period of paying crops is reached. They may be carried at a stationary value during the height of the cropping life, and then, as their fruitfulness begins to wane, the value may be gradually reduced and finally extinguished when the land is again cleared and put to other uses.

THE VALUATION OF FARM PRODUCTS AT COST OR MARKET VALUE; WHICH?

The rules given in the foregoing discussion on valuations represent, in a general way, the opinion of the American authorities on farm accounts. Some accounting authorities, however, notably

certain English farm accountants, claim that to base appraisals of farm products not yet sold on market value is wrong in principle, and that, as in commercial accounting, so in farm accounting, *cost* and not *market value* should be the governing principle in all valuations of such farm property.

It is unnecessary to go into a lengthy discussion here as to the merits of these differing opinions, but inasmuch as they do exist it is well to explain them briefly. The first, holding for *market value at the farm*, is based on the fact that the farm produces staple articles, the market for which is practically always open and the demand therefore unlimited, and in consequence the profit is actually made when the articles are *produced* and not when *sold*. The second holds that no profit is made until the produce is sold, and, presumably, the money actually in hand.

There is one feature that must be mentioned which supporters of the second idea have entirely overlooked. The farmer's "turnover" period (length of time necessary for realization on his operations) is at least an entire year, and at his discretion he may make it longer. Conditions of market may cause him to withhold his products from sale from the year in which they are produced to a subsequent year, and inventory valuations made at *cost* would result in showing an entirely erroneous state of affairs, in that the profits of the first year might be entirely eliminated and those of the second year doubled. To illustrate this point, let it be supposed that a farmer prepares his farm land, plants and harvests a crop of corn, and, because of market conditions, holds this crop for some time and finally sells it along with the crop of the succeeding year. As the costs of this crop have all been included in the accounts of the year in which raised, it does not appear justifiable to credit all the profit thereon to the year in which sold. In fact, to the farmer who wants to know how one year's operations compare with another, such a practice would undoubtedly seem absurd, as, in fact, it is.

"It may very properly be asked, what is the chief object and incentive of the farmer in keeping records and accounts? Is it merely for the academic purpose of securing abstract facts, or is it to furnish him with facts that will enable him to discern the practical result of his operations, year by year, and be of value to him in bettering his affairs?"¹ Certainly there can be but one answer, as far as practical opinion is concerned.

When the inventory is made at the end of the year, one of its important uses is to enable its owner to know what *that particular year*, and not some future year, has produced in the way of profit.

Valuations based on market value at the farm will give this information; valuations based on cost will not.

¹ James Wyllie, Lecturer, West of Scotland Agricultural College.
156416°—20—Bull. 511—3

TIME TO TAKE AN INVENTORY.

The best time to take an inventory varies in different parts of the country, depending upon region and business practice. In the Northern and Eastern States perhaps the best date is March 1 or April 1; in the South an earlier date would probably fit conditions better. In the Central States March 1 is undoubtedly the best time, as all farm business transactions in that region date therefrom, while in the northeastern part of the country the farmers' usual date of reckoning is April 1. This ordinarily corresponds with the date on which tenants change farms. On specialized farms special dates may be most convenient. Fruit farms, truck farms, and the like find January 1 a satisfactory date. On poultry farms September 1 or October 1 is a good date, because the new poultry year usually starts at the time the hens are placed in winter quarters. Thus it will be seen that the most convenient time for taking an inventory varies with conditions.

Upon the completion of the inventory the most important of the year's records is finished, for, as already stated, the inventory is the basis on which is erected the future system of records. Without an inventory it is impossible for any business man to know definitely what he is gaining or losing, but having a good clear inventory of all his property he is prepared to keep such further records as will give him the information he desires at the end of the year.

THE FARM INVENTORY AS A "BALANCE SHEET."

The "balance sheet" is the form of statement used in the business world to set forth the standing of a commercial firm. In the business world the uses of the balance sheet are very important, as a great deal depends upon its showing. One of its uses is as a basis of credit. When a dealer wishes to establish a line of credit with a bank or a wholesale house, it is the usual custom to forward for inspection his latest balance sheet, duly authenticated.

Of recent years companies have been formed which examine the balance sheets of business firms and "rate" them—that is, fix their standing from a credit viewpoint. These "credit ratings," as they are called, are then published annually in book form, and they constitute a most important source of information on business credits.

This method of rating credits has proved a great convenience to business men, both those asking credit and those from whom credit is asked. Farmers have never had the benefit heretofore of this convenience. Credit men have come to believe, with every reason, that few, if any, farmers can submit a statement or "balance sheet" that will satisfactorily serve as a basis for the granting of a line of credit. Accordingly, farmers have had to depend for needed credit on local

firms, no matter how inadequate their facilities or how unsatisfactory their terms and interest rates. This state of affairs was one of the factors that resulted in the establishment of farm-loan banks.

Although it is not the purpose in this bulletin to go into all the details, and sometimes complexities, involved in the preparation, auditing, and certification of commercial balance sheets, it is thought proper, in view of the foregoing facts, to set forth clearly how farmers who have made good inventories have all the essential data from which to construct a balance sheet should occasion demand it. A complete farm inventory contains all the elements of a balance sheet, except that the various capital elements (investment, surplus, reserves, undivided profits, etc.) of the balance sheet are embraced within the single item, heretofore termed "net worth" in the inventory, and that certain accrued and unexpired expense items of minor import may have been omitted. The arrangement is, however, considerably different.

As an example of a balance sheet constructed from a farm inventory, Table II has been prepared from the 1919 values of the inventory given in Table I. As will be seen, the arrangement differs from that of the inventory and many of the details are omitted, but the salient factors are there and arranged in one of the accepted commercial balance-sheet forms.

The assets are listed first, and are divided into current assets (or those readily available) in the order of their "liquidity" (or quickness of availability in case of necessity) and fixed assets in the order of their "fixity." It will be noticed that all the property that goes to make up the farm "plant" or permanent equipment necessary to carry on the business in its customary channels is listed under the fixed assets.

The liabilities are arranged according to the order in which they will have to be paid or "liquidated." The difference between the total assets and total liabilities, heretofore designated "net worth," represents the amount invested plus the net amount of profits (or minus the net losses) not yet withdrawn for personal use.

TABLE II.—*Sample of a farm balance sheet prepared from a complete farm inventory.*

BALANCE SHEET.

JOHN DOE, *Doeville, Va.*, APRIL 1, 1919.

ASSETS.

Current assets:

Cash on hand and in bank	\$195. 49
Accounts receivable	68. 00
Grain on hand (per inventory)	495. 60
Hay on hand (per inventory)	300. 00
Market live stock (per inventory)	144. 00
Farm supplies (deferred expense)	57. 45
Total current assets	\$1,260. 54

Fixed assets (present values):

Land and buildings-----	\$9,600.00
Machinery and tools-----	1,498.25
Work horses-----	560.00
Productive live-stock herds-----	909.00
Total fixed assets-----	<u>\$12,567.25</u>
Total assets-----	<u><u>13,827.79</u></u>

LIABILITIES.

Accounts payable-----	\$200.00
Mortgage payable-----	4,000.00
Total liabilities-----	<u>4,200.00</u>

CAPITAL.

Capital invested plus undivided profits-----	9,627.79
Total liabilities and capital-----	<u><u>13,827.79</u></u>

FINANCIAL ACCOUNTS.

In starting to keep a record of cash received and paid out it is of the utmost importance to know definitely just what records are wanted.

WHAT ACCOUNTS TO KEEP.

An adequate schedule of the headings under which it is desired that the farm receipts and expenditures shall be segregated is an essential step to successful farm bookkeeping. A proper "classification of accounts," as this step is designated in commercial accounting, is in line with the first essential requisite for bookkeeping, namely, "to know what accounts to keep."

Among accounting authorities there are several well-defined systems of classifying accounts, but not all these need be taken up here. The classification presented in Table III as a suggestion for farm bookkeeping purposes is based on farm experience and is also in line with accounting authorities.

TABLE III.—A suggested classification for accounts to be used in farm bookkeeping.

ASSET ACCOUNTS.

Cash in bank.
Petty cash (pocket change, etc.).
Accounts receivable.
Notes receivable.

LIABILITY ACCOUNTS.

Accounts payable.
Notes payable.
Mortgages payable.

PROPRIETORSHIP ACCOUNTS.

Invested:

Capital invested.
Proprietor's personal.
Proprietor's household.

Purchases:

Live stock purchased.
Machinery and tools purchased.
Building materials for permanent improvements.

PROPRIETORSHIP ACCOUNTS—Continued.

Modern improvements purchased.

Income:

Crop sales.

Crop product sales.

Live stock sales.

Live stock product sales.

Miscellaneous sales.

Incidental income.

Expense:

Labor.

Purchased feed.

PROPRIETORSHIP ACCOUNTS—Continued.

Expense—Continued.

Live stock expense.

Crop supplies.

Maintenance of machinery and tools.

Maintenance of buildings and other land improvements.

Insurance and taxes.

Interest.

Incidentals.

Depreciation.

This classification is very elastic and may be expanded or contracted at will, when conditions seem to demand it, by subdividing or combining the account headings presented. For instance, if expansion seems desirable, crop sales account may be subdivided so as to include a separate account for each crop sold, live stock expense account may be subdivided into veterinary expense, shipping expense, etc., and so on through the entire list.

If, on the other hand, fewer accounts are thought to be sufficient, the classification may be contracted by combining all the sales into one account.

This process of condensation carried out fully might finally result in a classification somewhat as follows:

Asset accounts:

Cash.

Accounts and notes receivable.

Inventories.

Liability accounts:

Accounts, notes, and mortgages payable.

Proprietorship accounts:

Investment and withdrawal.

Purchases (live stock, improvements, equipment).

Income (sales and incidentals).

Expense.

MIXED ACCOUNTS.

It is very necessary in accounting that "mixed" accounts shall be avoided, since they require analysis to interpret properly their meaning. By "mixed accounts" are meant those which carry items of asset or liability values along with those of income or expense. An example of a mixed account is given in Table IV. Here the account with "dairy" includes asset values (value of the dairy herd), income values (sales of dairy products), and expense values (cost of feed, etc.). Before the desired facts about the dairy enterprise can be ascertained, such an account must be "analyzed" or separated into property values, income, and expense. If there had been three accounts headed "Dairy herd," "Dairy income," and

“Dairy expense,” these three accounts would have set forth in their totals the distinct facts desired relative to this enterprise, without any study or analysis being necessary.

TABLE IV.—Sample of a “mixed” account or account carrying more than one class of financial data. This account carries three distinct classes, namely, asset (a), income (i), and expense (e).

CHARGES.				DAIRY ACCOUNT.		CREDITS.	
Date.	Item.	Amount.		Date.	Item.	Amount.	
1918							
Jan. 1	Inventory of herd (a).....	\$2,250	00	Jan. 3	Check for milk (i).....	\$85	00
10	Feed, 1,000 lbs. (e).....	28	00	14	Sold 2 veals (i).....	36	70
16	Disinfectant, $\frac{1}{2}$ gal. (e).....		75	16	Sold feed bags (e).....	1	00
						122	70
20	Bought 2 cows (a).....	256	00		Balance.....	2,462	05
28	Bought bull calf (a).....	50	00		Total.....	2,584.	75
	Total for January.....	2,584	75				
Feb. 1	Balance brought down.....	2,462	05				

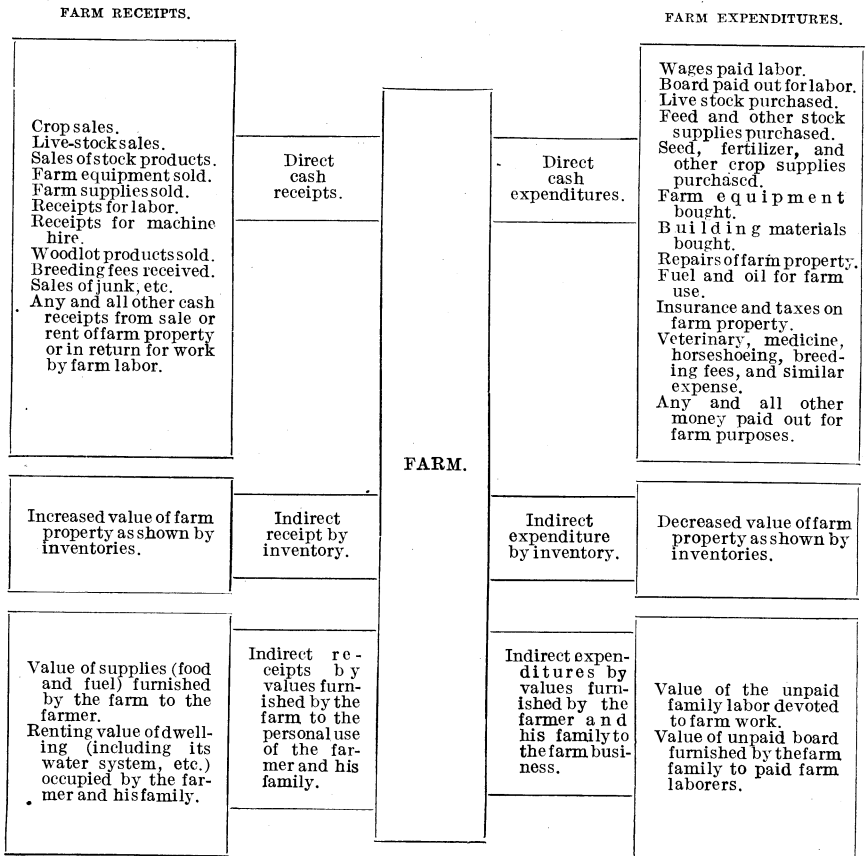
The totals for January, and the balance brought down on February 1, mean absolutely nothing as presented in this table. If the proper accounts had been kept the books would show directly and without the slightest analysis that the investment in the dairy herd stood at \$2,556, the dairy receipts for January were \$121.70, and the expenses \$27.75 (\$28.75, less \$1 for feed bags sold). It is just as easy to “post” items to a detailed account as to an account where everything is lumped together, and each account carrying a definite set of facts tells its story at a glance.

It is therefore an important provision to avoid mixed accounts wherever possible. The classification of farm accounts exhibited in Table III contains no mixed accounts. Separate accounts with each crop or group of live stock may be carried, but these vary so much on different farms that no attempt has been made to indicate them. A system founded on the accounts shown here will permit the drawing off of a statement of balances (technically termed a “trial balance”) at any time, which together with the inventory will present all the necessary facts without further analysis. Every man must suit himself in the accounts he intends to keep. If it is not thought advisable to start so many accounts, mixed accounts may be carried, but it is better that they be avoided.

THREE DISTINCT CLASSES OF FARM RECEIPTS AND EXPENDITURES.

It may be well, at this point, to explain clearly the three distinct ways income may come and expenses accrue in the farm business. This may be made clear by a study of the following diagram :

Diagram of farm receipts and farm expenditures.



Here the farm is considered as the unit of the accounts, and the three distinct classes of receipts and expenditures, with the various items they embrace, are indicated. The three sources of receipts may be termed "cash," "property," and "personal benefit," while the expenditures may be classed as "cash," "property," and "personally furnished." The cash classes will be completed by considering as farm receipts all money received from sales of farm products, or rent of farm property, or for labor for others, and the money spent for everything bought for farm purposes as a farm expenditure.

The property items are covered by the increase (a receipt) or decrease (an expenditure) in the inventory at end of a year as compared with that at the beginning. A man may make improvements on his place, such as building a barn or putting in a system of tile drainage, and thereby greatly increase the value of his farm. As the cost of these improvements may be made up of farm labor and materials included in the farm expenditures, this increase represents a receipt just

the same as crops or live stock sold. It is, however, received indirectly. The only way this receipt will come into the farm accounts is through the inventory. Likewise, a man may have sold during the year a considerable amount of produce he had on hand at the beginning of the year and most of the salable produce of the current year. As these sales are all included in the receipts of the current year, it is necessary that the decreased value of the inventory resulting from the greatly diminished value of salable produce on hand be taken into consideration as an expenditure. This, likewise, can enter the records only through the inventory.

Sometimes an expense item, such as "one horse died, value \$100," is found in the expense record on a farm. This item has been added in with the other cash expenditures when in reality it is not a financial expenditure at all. True, it is a loss, but this loss will properly be shown in the decreased value of the horses in the second inventory.

The third class, which has been termed "personal benefit" receipts and "personally furnished" expenditures, is more difficult to determine accurately than the first two, but the proper kind of records will determine the approximate value of these.

RECORD OF BENEFITS FURNISHED BY THE FARM TO THE FAMILY.¹

The benefits furnished to the family by the farm include food, fuel, and the renting value of the dwelling occupied by the farm family. The latter item requires no record, but may be estimated according to the value, size, conveniences, or other particulars of each dwelling. As the fuel furnished is usually supplied in quantity but once or twice a year, a record of this value should cause little trouble.

The food supplies furnished consist of a multiplicity of items, including milk, butter, eggs, poultry, beef, lamb, pork, veal, fruit, vegetables (both green and dried), and honey. To record the value of all these as furnished may seem a somewhat hopeless task, but the work may be made much simpler than is supposed (see *Farmers' Bulletin* 964). It is not necessary for farm accounting purposes to keep a fully detailed list of these supplies, though it is often of value and interest to do so. This record should preferably be kept by the housekeeper, who should be provided with a good-sized book for this purpose, as the pages of small books are soon filled and require much carrying forward of subtotals. To quote from *Farmers' Bulletin* 964:

It may seem difficult to make record of each bunch of beets, each head of lettuce, each quart of berries, and each quart of milk as taken from the garden or saved from the day's supply of milk. The task is not so arduous as it may seem, however. During the summer, when the farmer's wife is busy, she may

¹ *Farmers' Bulletin* 635, "What the Farm Contributes Directly to the Family Living," and 964, "Farm Household Accounts," will furnish valuable information on this subject.

not have time to do this every day, or, she may forget. This need not seriously affect the value of the record, since the average housekeeper can estimate very closely the quantity of the various kinds of vegetables, the number of eggs, the quarts of milk, etc., used during the week. Thus she can find time once a week or oftener and bring her record up to date. At the end of the year her record probably would be sufficiently accurate for all practical purposes. It may be well to lay stress on the more important items.

RECORD OF PERSONALLY FURNISHED FARM EXPENDITURES.

This class of farm expenditures includes the value of the farmer's time given to farm work, the value of the unpaid farm labor performed by the members of the farmer's family, and the value of board furnished to paid farm laborers by the farm household. The first of these can be estimated at the end of the year, and should be based primarily on the estimated wages necessary to secure a man who could adequately fill the farmer's place as worker and manager. This value should never be based on what the farmer is able to make out of his business in wages, interest, and net profit, as this would be another instance of "overcapitalizing" and would not be based on actual cost to replace his services.

The value of the unpaid farm labor of the family should be based on the same value, namely, what it would have cost to hire the workers to do the labor that they performed. A record of this may be set down once a week, or oftener if there is a great deal of it.

The value of the board furnished can best be stated by the month for month hands and by the week for day laborers. It should be based on what farmers who board their hands out with others pay, or the amount that must be added to wages if board is not furnished.

In the foregoing discussion the farm has been considered as a unit and, in no case, has the relation existing between the different enterprises on the farm been considered. Consequently the records that have just been explained will not show the profit or loss on each crop or class of stock, since they pertain to the farm as a whole and not to any individual department.

"BALANCING" THE CASH.

In order to make the cash account "balance," that is, to agree with the amount of cash on hand or in bank, record must be made of all items, and the periodical "balancing" of the cash account is a valuable check against omissions and erroneous entries. Inasmuch as the household items are usually bought along with those of the farm, they must in such cases necessarily be included in the records, but if means can be taken to keep them entirely separate from the farm accounts it will result in a saving of time and work in the keeping of the latter. By examination of the account books of eight farms it

was found that of all the cash transactions recorded, the items pertaining strictly to the farm formed 54.6 per cent, the personal items 22.1 per cent, and the household items 23.3 per cent. The average number per year of cash items entered on the books was 577, and of this number but 315 were farm items. Detailed household accounts are of great interest and distinct value, and it is not intended here to offer any discouragement to the keeping of them. The point is that they should, where conditions permit, be kept entirely separate from the farm records, or as nearly so as possible.

The only reason for keeping the household and personal items along with those of the farm is to permit the balancing of the cash account. They add work to farm bookkeeping and are not a part of the real farm records. If they can not be kept separate, it would seem best not to keep the household and personal items in detail, but to combine all these entries for each day into one item and, if desired, let the housekeeper keep the detailed record of them. All the items pertaining in any way to the farm business should be itemized carefully. An illustration of desirable and undesirable detail is given in the two examples following:

Illustration of combining items in entry of household and personal items; also of complete detail in entry of items pertaining to the farm.

COMPLETE AND DESIRABLE.

1919		Item.	Received.	Paid.
Sept.	29	Coal for thrashing, three-fourths ton, at \$6.....		\$4.50
		Household expense.....		.89
	30	Sold 2 tons hay of this year's crop, at \$20.....	\$40.00	
		Personal expense.....		4.55

Illustration of undesirable detail in entry of household and personal items; also of incomplete detail in entry of items pertaining to the farm.

INCOMPLETE AND UNDESIRABLE.

1919		Item.	Received.	Paid.
Sept.	29	Coal.....		\$4.50
		2½ pounds beef.....		.45
		Bread.....		.20
		3 pounds rice, at 8 cents.....		.24
	30	Hay.....	\$40.00	
		Cravat.....		.25
		Shoes.....		4.00
		Candy and peanuts.....		.30

An excellent way to keep the farm records entirely separate is to allow the housekeeper whatever sum may be necessary to cover the household expenses for a week or a month and enter this in the farm records as one item at the time it is paid.

PURCHASES AND SALES ON CREDIT.

Articles bought or sold on credit should not be entered in the cash accounts until the money is collected or paid, for if this is done there may sometimes slip in a duplicate entry of a single item. Of course, a memorandum should be made at the time of sale or purchase so that such items may not be overlooked. Such a memorandum will further be useful at the end of the year, as the list of accounts for the inventory can be made up from it. After the total cash receipts and expenditures have been found for the year, the amounts received or paid during the year on accounts owing or owed at the beginning of the year should be deducted, as these receipts and expenditures pertain to the previous year. Correspondingly, at the end of the year any accounts owed or owing should be added to the cash items in order that all the items actually pertaining to the current year may be included in its accounts (see Table X).

FORMS FOR KEEPING FINANCIAL RECORDS.

There are a number of methods for keeping farm financial records. A form well adapted for handling the cash records is known as a day-book form, and books with this ruling can be bought almost anywhere. It consists of a page ruled with double money columns, the left-hand one to be used for items and the right-hand one for totals. While this form is very simple and can be procured anywhere, there are various other forms, many of which are useful, and in many cases better than the one described. These will be described further along. While farm bookkeeping is not a question of forms, but rather of what accounts to keep and how to keep them, convenient forms are timesavers in the long run. However, the most carefully devised bookkeeping blanks will not show good farm records unless the person using them has a clear idea of the principles and of the purpose in view.

There are two methods of making the entries in the form described. The first, a method commonly used by many farmers, is to enter "receipts" on one page and "expenditures" on the opposite one. Table V illustrates how the record appears when kept in this manner. This is a simple, easy way to keep the records and, as such, it will prove satisfactory. If followed through to the end of the year it will give a complete record of all the cash transactions, but if one wishes to know the aggregate income from the sale of eggs or of milk it will be necessary to go through the year's records and pick out all the items of sales of these products and add them separately. In other words, the foregoing method gives the total receipts and expenditures, but does not classify them.

TABLE V.—One method of keeping cash receipts and expenditures.

1918. RECEIPTS (left-hand page).			
Apr.	2	20 bushels potatoes, at 90c.....	\$18. 00
	2	18 dozen eggs, at 41c.....	7. 38
	7	2 tons hay, at \$22.....	44. 00
	7	1 cow to J. Brown.....	77. 50
	7	30 dozen eggs, at 40c.....	12. 00
	7	3 bushels seed potatoes, at \$1.50.....	4. 50
			\$163. 38

1918. EXPENDITURES (right-hand page).			
Apr.	2	1 ton cottonseed meal for dairy.....	\$55. 00
	2	Strap for work harness.....	. 35
	2	Personal.....	2. 25
	2	Household.....	1. 60
	7	Garden seeds.....	8. 00
	7	Express on seeds.....	. 85
	7	2 milk pails.....	2. 00
	7	Household.....	. 86
	7	Repairing plow.....	1. 20
			\$72. 11

In order to ascertain what each farm department returns and each kind of expense amounts to for the year it becomes necessary to classify all the items under their respective headings. This is usually done in another book, known as a "ledger" in which one page is devoted to each heading under which it is desired to classify items, and the operation of classifying or transferring the items to their respective heads is known as "posting." At the end of the year the totals of each heading in the ledger can be taken off and a statement prepared. Table VI illustrates a classified statement of the receipts and expenditures as taken from a farm ledger.

TABLE VI.—Illustrating a fully detailed summary statement of cash receipts and expenditures on a farm for a year.

April 1, 1918, to March 31, 1919.

RECEIPTS (CASH).

Farm receipts: :

Accounts receivable (owing April 1, 1918):		
George Jones paid for corn.....		\$42. 00
Notes receivable (owing April 1, 1918):		
Harry Smith paid his note.....		100. 00
Machinery and tools sold.....		26. 90
Forge.....	\$4. 65	
Bolster springs.....	4. 00	
Horse collars (3).....	8. 00	
Junk machinery.....	5. 65	
Crocks, 1-gal. (46).....	4. 60	

Farm Bookkeeping.

29

Farm receipts—Continued.

Buildings supplies sold		\$11.89
Shingles (5 bundles)	\$7.50	
Nails (60 pounds)	3.99	
Blind hanger	.40	
Work stock sold, 1 horse		35.00
Permanent live stock sold, 1 sow		56.00
Crop sales		1,236.33
Hay (24 tons)	625.50	
Wheat (159 bushels)	333.73	
Clover seed	258.30	
Seed corn	4.20	
Apples	14.60	
Crop product sales (apple butter)		77.50
Live stock sales		212.33
Steer (1,080 pounds at 9 cents)	97.20	
Hogs (2) (580 pounds at 15 cents)	87.00	
Pigs (2)	12.00	
Poultry	16.13	
Live-stock product sales		394.29
Beef (1) (825 pounds; 17.3 cents average)	142.89	
Hide, tallow, and pluck	15.17	
Butter (90 pounds; 44½ cents average)	40.01	
Hog skins (2)	2.00	
Eggs (423¼ dozen; 46 cents average)	194.22	
Miscellaneous sales, (muskrat skins)		22.66
Incidental income		20.50
For use of horse	18.00	
For outside labor	1.50	
For rent of tedder	1.00	
Total farm receipts (in cash)		2,235.40
Personal receipts:		
Interest on Liberty bonds	10.00	
Jury fees	4.00	
Total personal receipts		14.00
Total receipts (cash)		2,249.40

EXPENDITURES (CASH).

Farm expenditures:

Real estate improvement supplies		\$429.82
Drain tile, including freight	\$272.87	
Use of State ditcher	138.80	
Fencing and gates	18.15	
New machinery and tools		66.30
One-horse wagon	60.00	
Hog trough, metal	4.80	
Shovel	1.50	
Permanent live-stock purchases		165.00
Heifer, two-year-old	55.00	
Bull calf for raising	10.00	
Brood sows (2)	100.00	

Farm expenditures—Continued.

Market live-stock purchases-----		\$104.00
Steer, two-year-old-----	\$90.00	
Pigs (2)-----	14.00	
Labor-----		230.82
Purchased feed-----		87.08
Corn, ear (74 bushels, at 73 cents average)-----	54.10	
Oil meal (235 pounds, at \$3.54 average)-----	8.32	
Tankage (100 pounds, at \$6)-----	6.00	
Bran (400 pounds, at \$3.50)-----	14.00	
Poultry feeds-----	4.66	
Live-stock expense-----		19.12
Veterinary-----	8.00	
Dairy salt (1½ barrels)-----	4.95	
Poultry grit, shell, and charcoal-----	2.75	
Freight on eggs-----	2.42	
Breeding fees-----	1.00	
Crop supplies-----		195.28
Acid phosphate (2 tons 16 per cent)-----	54.00	
Seed-----	78.38	
Lime (5 tons, at \$6)-----	30.00	
Twine (50 pounds, at 25 cents)-----	12.50	
Thrashing bills-----	20.40	
Maintenance of machinery and tools-----		31.96
Repairs-----	8.14	
New parts-----	10.15	
Fuel and oil-----	13.67	
Maintenance of buildings and other land improvements-----		43.73
Lumber-----	21.20	
Nails and hardware-----	3.53	
Cement-----	4.00	
Carpenter and mason-----	15.00	
Insurance and taxes-----		104.23
Interest (on mortgage \$200, other \$5.60)-----		205.60
Incidentals-----		20.47
Total farm expenditures (in cash)-----		1,703.41
Personal and household expenditures-----		606.85
Total expenditures (cash)-----		2,310.26

The second method of making the entries in the record book is to carry the original entry direct to its account in the ledger without first entering it in the "daybook." By this method all items pertaining to the sale of milk and other dairy products will be entered in an account headed "Dairy sales," all items for the sale of eggs and chickens will come under the "Poultry" accounts, etc. This is known as a "direct entry" method or "classified daybook" system and is illustrated in Table VII. The main objection to this method is that it is practically impossible to keep the cash balance in agree-

ment with the record book, and "mixed" accounts are almost certain to result, as the table shows.

Some students of farm bookkeeping recommend carrying the inventory amounts into the ledger accounts, but it is much simpler and better not to do so. No object is to be gained by so doing, as the record is more handy to use in its original form than it would be spread through the ledger pages. Furthermore, in no class of entries are mistakes more likely to be made than in handling these amounts through the ledger accounts. It must always be remembered, however, that any information or interpretation desired from the accounts must always take into consideration both the accounts in the ledger and the inventories.

TABLE VII.—*Cash items entered direct to their respective accounts.*

DAIRY.					
1918.					
RECEIVED (right-hand page).					
Apr.	9	2 cows to C. Brown.....	\$188.00		
	9	1 yearling to Smith.....	19.00		
	15	Milk and cream.....	114.25		
					\$321.25
1918.					
PAID (left-hand page).					
Apr.	2	1 ton cottonseed meal.....	\$55.00		
	2	2 milk pails.....	2.00		
	10	1 cow from A. Johnson.....	107.50		
	10	One-half ton bran.....	15.50		
					\$180.00

A third method for recording the financial items is similar in principle to the two already described, but is different in application. It consists of entering the items as in the first method described, with the difference that the pages are ruled in a number of columns and each item is entered in the column headed by the account name to which it pertains. As all the items are entered in proper sequence, it is possible to check them with the cash balance, even though they are classified under their respective headings. This kind of a record is known as a "special column" cashbook and the main objection to it is that unless a book of very wide pages is used it does not admit of many accounts. However, on most farms, only a few accounts are needed. Table VIII illustrates accounts kept by this means.

TABLE VIII.—*Form illustrating special-column cashbook; items entered direct to separate accounts.*

1918.		Item.	Dairy.	Poultry.	Crops.	General.
Apr.	2	2 calves to Jones.....	\$35.00	.....	.....	.....
	3	2 tons of hay to Brown.....	.....	.....	\$44.00	.....
	4	10 dozen eggs, at 40 cents.....	.....	\$4.00	.....	.....

TABLE VIII.—Form illustrating special-column cashbook, etc.—Continued.

EXPENDITURES.

Apr.	2	1 ton wheat bran.....	\$40. 00	.....	.....	.....
	2	10 bushels seed oats, at \$1.....	.....	.....	\$10. 00	.....
	7	2 bags chicken wheat.....	.....	\$2. 50	.....	.....

A fourth system is known as the "bank book" or "check" method. To practice this method it is necessary that all the farm funds be passed through the bank account. When funds are deposited in the bank a duplicate deposit slip is made out, on the back of which is recorded the articles for which the cash was received. Likewise when checks are drawn the articles for which the money is expended are noted on the check-book stub, or special checks may be used bearing on their face a notation of the object for which drawn. This is a very simple scheme and has much to recommend it.

The duplicate deposit slips and check stubs, carefully preserved, form a complete financial record, and the records automatically agree with the cash balance. There is one inconvenience encountered in this method. There are many expenditures of a few cents here and there, and it is impracticable to draw a check for each of these petty amounts. There are several means of overcoming this difficulty. One is to open an account at the store for these petty items and draw a check periodically to pay for them. The items can then be classified on the check stub. Another means is to adopt what is known as the "petty cash" method. A small sum of money is set aside to pay these minor items and charged to a petty cash account. From this the little expenses are paid, and when the sum is depleted a check is drawn to cover the total of items paid out of it, classifying the items on its stub, and the check is then cashed and the money put back in the petty cash fund.

A fifth method is known as "the farm diary method" and consists of using a book supplying a separate page for the records of each day throughout the year. This method is thoroughly explained in Farmer's Bulletin 782 and will only be mentioned here. The main objection to it is that the records must be "posted" as described in the discussion of the first method given, but it has the considerable advantage of providing a definite system for the recording of all the miscellaneous happenings which are of interest and value.

No matter which method is decided on for keeping the cash records, the object is the same in every case, namely, to secure a complete detailed list of all the sources of revenue and all the things for which money is spent, with the amount under each head. Table VI has already illustrated such a detailed list and Table IX is presented to

illustrate how, if so much detail is not desired, the data may be summarized under more general headings. The fully detailed summary is, however, to be recommended.

TABLE IX.—*Illustrating a summary of cash receipts and expenditures on a farm for a year under general nondetailed headings.*

April 1, 1918, to March 31, 1919.

RECEIPTS (CASH).

Farm receipts:

Accounts and notes receivable-----	\$142. 00
Crop sales-----	1, 236. 33
Crop-product sales-----	77. 50
Live-stock sales-----	303. 33
Live-stock-product sales-----	394. 29
Miscellaneous sales and other farm income-----	81. 95

Total farm receipts-----	\$2, 235. 40
Personal receipts-----	14. 00
Total receipts (cash)-----	2, 249. 40

EXPENDITURES (CASH).

Farm expenditures:

Live-stock purchases-----	\$269. 00
Real-estate improvement and maintenance-----	473. 55
Machinery purchases and maintenance-----	98. 26
Live-stock expense-----	106. 20
Crop expense-----	195. 28
Labor-----	230. 82
Miscellaneous farm expenditures-----	330. 30

Total farm expenditures-----	1, 703. 41
Household and personal expenditures-----	606. 85
Total expenditures (cash)-----	2, 310. 26

CLOSING THE BOOKS.

"Closing the books," in the ordinary acceptance of the term, is the process of entering the balance of each ledger account on the lesser side of the account, bringing down equal totals on each side, and ruling the account off. The balances are then carried to a "profit and loss" account, if the ledger account ruled off is income or expense account, or brought down below the ruling as a new balance, if the account ruled off is an asset or liability account.

This process is usually stressed as very important by some students of farm bookkeeping. Often the inventory amounts are brought on the books just prior to starting to "close" them, and the farmer bookkeeper following this method soon finds himself floundering in a

maze of cross entries, balance transfers, and rulings bewildering even to many men more trained in the handling of figures than he.

No such process is necessary or advisable in simple farm bookkeeping. If the methods outlined in this bulletin are adhered to they will give all the information the most approved, detailed, and technically correct "closing" of the books will give, will present the information in just as interpretable form, and will be accomplished with considerably less work, worry, and confusion of detail. It is recommended, however, that the various ledger accounts be marked or checked off as their respective balances are transferred to the summary of receipts and expenditures (Tables VI and IX) in order that they may not inadvertently be included in the totals for the coming year.

DETERMINING NET FARM INCOME AND NET FARM PROFIT.

Having ascertained the total farm receipts and the total farm expenditures and the value of the interrelated items, the next thing is to determine the net farm income. The term "farm income" or preferably "net farm income" (as the receipts themselves are sometimes termed farm income) is used to denote the balance left after the total of farm expenditures is deducted from the total of farm receipts. Out of this balance, or the net farm income, must come a fair return for the farmer's labor and for the use of his capital, before any of it may be termed net profit. (See Table X.)

TABLE X.—*Illustration of method of determining net farm income and net farm profit from inventories and cash accounts, making due allowances for cash items not pertaining to the particular year and for all noncash, interrelated items between the farm and the family.*

INVENTORIES (PHYSICAL OR TANGIBLE ONLY).

	Value.			
	Apr. 1, 1918.	Apr. 1, 1919.	Increase.	Decrease.
Real estate.....	\$9,600.00	\$9,600.00	.....	.....
Live stock.....	1,185.00	1,613.00	\$428.00	.....
Machinery and tools.....	1,633.50	1,498.25	.....	\$135.25
Farm produce.....	648.00	795.60	147.60	.....
Purchased feeds and supplies.....	7.58	57.45	49.87	.....
Totals.....	13,074.08	13,564.30	625.47	\$135.25
Subtracting the lesser.....	.....	13,074.08	135.25	.....
Balance, net increase (a farm receipt).....	.....	490.22	490.22	.....

FARM RECEIPTS.

Financial receipts:

Cash receipts.....	\$2,235.40
Add value of current year sales not yet received in cash (see financial inventory).....	68.00
	<u>2,303.40</u>
Subtract payment of last year's bills in- cluded in cash receipts (Table VI).....	142.00

Net financial receipts applicable to this year..... \$2,161.40

Property receipts:

Net increase in inventory (a property receipt)..... 490.22

Personal benefit receipts:

Value of food supplies furnished family....	\$439.74
Value of fuel furnished family.....	58.00
Renting value of farm dwelling.....	180.00

Total personal benefit receipts..... 677.74

Total farm receipts..... \$3,329.36

FARM EXPENDITURES.

Financial expenditures:

Cash expenditures.....	\$1,703.41
Add amount of current year purchases not yet paid for in cash.....	200.00

Total financial expenditures..... 1,903.41

Property expenditures: (None; there was a net
inventory increase; not a decrease.)

Personally furnished expenditures:

Value of family labor on farm work.....	\$110.00
Value of board furnished laborers.....	60.00

Total personally furnished expenditures..... 170.00

Total farm expenditures..... 2,073.41

Net farm income..... 1,255.95

Income earned by capital and labor:

Interest at 5 per cent on total value of physical in- ventory, April 1, 1918.....	653.70
Deduct interest paid on mortgage (see page 36).....	200.00

Value of farmer's labor (estimated)..... 453.70
600.00

Total deduction for use of capital and labor..... 1,053.70

Net farm profit..... 202.25

The first step is to determine the net inventory increase or decrease, which is then carried below as a property receipt or a property expenditure, accordingly as it is found to be an increase or a decrease.

It will be noticed that in arriving at the inventory increase Table X does not include the accounts receivable, accounts payable, or cash on hand. This is because the money which is owed the farm has been added to the cash receipts, that which is owed by the farm to the cash expenditures, and the difference in cash on hand is reflected in

the difference between cash receipts and expenditures. Thus, while the complete inventory is properly used when there is no other record, as explained under Type I on page 8, only the *physical* inventory is used when figuring farm income and profit. The accounts payable and receivable are added to the receipts and expenditures because they really are such, and actually pertain to the year for which the statement is prepared. These points must be thoroughly grasped, and they are worthy of study.

The financial receipts and expenditures applicable to the year are determined by adjusting the cash receipts and expenditures by *taking out* all items included therein that do not rightfully pertain to this year, and by *adding in* all items of the year's business not yet settled for.

One item of this adjustment will require some explanation, namely, the deducting of the \$200 interest paid on the mortgage. This is done to prevent duplication, for if interest on the entire value of the physical property is deducted in ascertaining the net farm profit and, in addition, the interest actually paid on the mortgage covering a part of the same property, a double interest charge is made on the part covered by the mortgage. The interest paid on the mortgage has already been included as a deduction from income, as it is included in the total farm expenditures.

The duplication is avoided, as shown in Table X, by deducting the amount of interest actually paid from the interest as calculated on the value of the physical assets. This process closely follows the facts, as the capital, in this case, on which interest charges should be figured is not the total value of the property, but the remainder, or "equity" as it is sometimes called, after the amount of the mortgage is deducted.

Table X is worthy of careful study by all farmers interested in accounts. Some men have the idea that their success is measured only by the increase in cash, cattle, crops, etc., on hand at the close of the year, others take into account the complete inventories, but very few consider the value of the items representing the interrelation between family and farm. Taking the data given in Table X, which are from actual farm records, the benefits received counteract in value the values furnished by the family and leave a balance of \$507.74, which is as truly farm income as that received from the sale of produce to outsiders. If these items are not taken into consideration, the facts will not be presented in their true light, and consequently the accounts are not entirely successful and may be grossly misleading. The first, last, and only object of records should be to present the facts, all the facts, and nothing but the facts as closely as possible.

When the farmer determines the facts of his year's operations in the manner exemplified in Table X, he has data that will permit a

comparison of his lot in life with that of the city dweller working for a salary and with that of the city business man. His data, summarized in this way, will allow him to study his own business from the correct viewpoint.

INTERPRETATION AND USE OF FARM ACCOUNTS.

In the foregoing pages are outlined the reasons for farm bookkeeping, and methods and forms are suggested for bookkeeping on ordinary farms. The question arises, "How can the information gained by these records be applied to the various phases of the farm business?" Time and energy spent in keeping accounts are absolutely wasted unless an intelligent use is made of them. Moreover, one must not suppose that many records are needed before any information of value can be gleaned from them. It is surprising what useful information can be secured from a few simple records. It is even more surprising, however, what false interpretations can be drawn from a set of farm accounts by one who does not understand their real meaning. The information to be gained from interpretation of the results will be a matter of the requirements of each individual, but it ordinarily falls in one of the several groups which will now be illustrated.

WHAT HAS BECOME OF THIS NET FARM INCOME?

That is a question most commonly asked by farmers when their records show that their farm income has been larger than they had any idea of. In the case set forth in Table X this very question was asked, and answered as follows:

Net farm income (i. e., the amount out of which must come the household and personal expenses and the progress, financially, of the farmer).....	\$1, 455. 95
Add any personal income (see Table VI).....	14. 00
Total income available.....	<u>1, 469. 95</u>
Household and personal expenses:	
Cash (see Table VI).....	\$606. 85
Supplies and renting value from farm.....	677. 74
Gross household and personal expense.....	1, 284. 59
Value of board and family labor (deduct).....	170. 00
Net household and personal expense.....	<u>1, 114. 59</u>
Interest actually paid on mortgage.....	200. 00
Actual financial progress (see Table I).....	155. 36
Total income accounted for.....	<u>1, 469. 95</u>

This statement clearly answers the natural question above. By referring to page 9 it will be seen that this is the computation there

given, except that it is reversed, and that the interest paid on the farm mortgage does not enter into it.

LABOR INCOME AND EFFICIENCY FACTORS.

The question that naturally arises next is: "How do results on my farm compare with those of other farmers?" The method developed by farm economists for these comparisons involves the relation of farm "labor incomes" to certain elements of management which are termed "efficiency factors." Labor income is that part of the net farm income left after allowing for interest on investment; it is a term used by farm economists to represent the total amount the farmer receives for his labor and managerial ability as a farm operator. This labor income can be readily determined from a statement like Table X by adding the estimate of the value of the farmer's services (\$600) to the net farm profit (\$202.25). If there should be a net farm loss, instead of a profit, the amount of the loss should be deducted from the estimated value of the farmer's services. If the loss is larger than this estimate, the latter should be deducted from this loss. In this case there would be what is termed a "minus labor income," which means that the year's results have not even paid the proper interest on the investment by the amount of the minus labor income.

This term, "labor income," is of value to the economist in studying the relative profitableness of different farms as related to the average farm, the better farms, and the poorer. It is not generally used in farm bookkeeping, as here only a single farm is being studied by its operator. If it is desired to compare one's labor income with those in published data on farm economics, it can be determined as above explained.

For a study of all the efficiency factors that may be compared, the reader is referred to the list of publications in the back of this bulletin. Some of these that may be mentioned here are: Proportion of capital invested in each kind of farm property, proportion of income derived from various sources, income per cow, per brood sow, or per acre of crops, acres of crops per man and per work animal.

COMPARISON OF FARM PROFITS WITH BUSINESS PROFITS.

Another comparison that may be useful is to compare one's profits with those of some business or corporation in which one has a part interest or with which he is familiar. Many men who have taken up farming after business careers will find it interesting to compare results. This is usually done on a percentage basis. The merchant sizes up his profits on the basis of the percentage they are of the total sales, the corporation's profits are reflected in terms of rate of dividends and surplus increase as related to the total capital. For

the farmer who may wish to make such comparisons the following suggestions are offered:

To find the percentage of profits on the business done, proceed as follows, referring to Table X:

If the food and fuel furnished the family have been charged in at market value at the farm, as they should be, the value of these should be added to the financial receipts. This gives the total business done. Find the sum of the net farm profit and the interest on investment. This gives the business profits as understood by the merchant, who usually allows himself a salary, but does not charge in interest as a business expense. Find what per cent the business profit is of the total business and the rate of profit on business done is the resulting figure. Thus:

\$2,161.40 plus \$497.74 equals \$2,659.14; the total business done.

\$202.25 plus \$653.70 equals \$855.95; the profit on business done.

856 divided by 2,659 equals 0.32 or 32 per cent, rate of profit.

To find the relation the profits bear to the total capital, it is only necessary to ascertain what the capital is, as the total profits are already worked out. It is important in making this comparison that only the actual capital be used. To find this the amount of the mortgage must be deducted and, as interest actually paid thereon has not been included in expenses, it must now be included (as we are considering net capital, not gross) just as a corporation includes in its expenses the interest on its bonds. This may be done as follows, referring to Table X and previous computations:

\$855.95 less \$200 (interest on mortgage) equals \$655.95, which is the total profit from a corporation standpoint.

Total capital \$13,074.08 less mortgage \$4,000 equals \$9,074.08, or net capital (that is, capital from the corporation standpoint).

656 divided by 9,074 equals 0.072, or 7.2 per cent profit on capital.

It must be understood that these are not presented as samples of profits that the average farmer receives, but simply as illustrations of methods. While the accounting figures exhibited throughout this bulletin are based on actual farm figures, they are taken from a period of war conditions and are therefore not typical in any sense.

CONCLUSION.

As already stated, no attempt has been made in the foregoing pages to treat of the subject of cost accounting. It has been the aim rather to deal with as simple a record as possible and at the same time have the results of sufficient value to be of use to the farmer. The trained agricultural student or the business-college graduate will no doubt desire a more detailed system than has been outlined here, and in this desire he is perfectly justified. But the average farmer is not a trained accountant, and the very nature

of his work is such that it is hard for him to do clerical work. After being in the field all day, or out in a cold, biting wind, it requires considerable exertion to write up a set of books in the evening. The farmer is trained to do physical work, and, although he is usually intelligent and capable when it comes to deciding important matters, it is often difficult for him to do clerical work of this character. When physically tired it is doubly difficult to do such work as adding a column of figures.

Farm bookkeeping is a matter of adapting simple methods to the farmer's needs. It is not a question of forms or having the accounts on the right side of the page or of having them balanced in a certain way, but it is a question of a correct knowledge of principles which will lead to an understanding of the facts as they exist on the particular farm in question.

SELECTED LIST OF REFERENCES ON FARM BUSINESS ANALYSIS.

(Listed by regions to which they are applicable.)

NEW ENGLAND STATES.

- THOMSON, E. H. (1911). Agricultural survey of four townships in southern New Hampshire. U. S. Department of Agriculture, Bureau of Plant Industry Circular 75.
- ROBERTSON, F. E., and DODGE, L. G. (1913). Some profitable and unprofitable farms in New Hampshire. U. S. Department of Agriculture, Bureau of Plant Industry Circular 128. Miscellaneous Papers (A).

MIDDLE ATLANTIC STATES.

- BURRITT, M. C. (1909). The incomes of 178 New York farms. New York Cornell Agricultural Experiment Station Bulletin 271.
- WARREN, G. F., and LIVERMORE, K. C. (1911). An agricultural survey. Townships of Ithaca, Dryden, Danby, and Lansing, Tompkins County, N. Y. New York Cornell Agricultural Experiment Station Bulletin 295.
- WARREN, G. F. (1914). Agricultural surveys. New York Cornell Agricultural Experiment Station Bulletin 344.
- WARREN, G. F. (1914). Some important factors for success in general and dairy farming. New York Cornell Agricultural Experiment Station Bulletin 349.
- APP, FRANK (1916). Farm profits and factors influencing farm profits on 370 potato farms in Monmouth County, N. J. New Jersey Agricultural Experiment Station Bulletin 294.
- TURNER, H. A. (1916). Systems of renting truck farms in southwestern New Jersey. U. S. Department of Agriculture Bulletin 411.
- SPILLMAN, W. J., DIXON, H. M., and BILLINGS, G. A. (1916). Farm management practice in Chester County, Pa. U. S. Department of Agriculture Bulletin 341.
- APP, FRANK (1917). Farm profits and factors influencing farm profits on 284 general and 75 dairy farms in Monmouth County, N. J. New Jersey Agricultural Experiment Station Bulletin 312.

APP, FRANK (1917). Farm profits and factors influencing farm profits on 460 dairy farms in Sussex County, N. J. New Jersey Agricultural Experiment Station Bulletin 320.

APP, FRANK, WALLER, A. G., and LEWIS, H. R. (1918). Profits and factors influencing profits on 150 poultry farms in New Jersey. New Jersey Agricultural Experiment Station Bulletin 329.

SOUTH ATLANTIC STATES.

JOHNSON, O. M., and DADISMAN, A. J. (1915). An agricultural survey of Brooke County. West Virginia Agricultural Experiment Station Bulletin 153.

DIXON, H. M., and HAWTHORNE, H. W. (1917). An economic study of farming in Sumter County, Ga. U. S. Department of Agriculture Bulletin 492.

EAST NORTH CENTRAL STATES.

THOMSON, E. H., and DIXON, H. M. (1914). A farm management survey of three representative areas in Indiana, Illinois, and Iowa. U. S. Department of Agriculture Bulletin 41.

MCDOWELL, J. C., and WALKER, W. B. (1916). Farming on the cut-over lands of Michigan, Wisconsin, and Minnesota. U. S. Department of Agriculture Bulletin 425.

SMALLEY, H. R. (1916). Management of muck-land farms in northern Indiana and southern Michigan. Farmers' Bulletin 761.

BOEGER, E. A. (1918). A study of share-rented dairy farms in Green County, Wis., and Kane County, Ill. U. S. Department of Agriculture Bulletin 603.

DIXON, H. M., and DRAKE, J. A. (1918). A study of farm management problems in Lenawee County, Mich. U. S. Department of Agriculture Bulletin 694.

HAWTHORNE, H. W. (1918). A five-year farm management survey in Palmer Township, Washington County, Ohio. U. S. Department of Agriculture Bulletin 716.

TAYLOR, H. C., and MENDUM, S. W. (1919). War prices and farm profits. Wisconsin Agricultural Experiment Station Bulletin 300.

EAST SOUTH CENTRAL STATES.

BOEGER, E. A., and GOLDENWEISER, E. A. (1916). A study of the tenant systems of farming in the Yazoo-Mississippi Delta. U. S. Department of Agriculture Bulletin 337.

ARNOLD, J. H., and MONTGOMERY, FRANK (1917). Farming in the Blue-grass region. U. S. Department of Agriculture Bulletin 482.

ARNOLD, J. H. (1917). The business of ten dairy farms in the Blue-grass region of Kentucky. U. S. Department of Agriculture Bulletin 548.

ARNOLD, J. H., and NICHOLLS, W. D. (1917). Important factors for successful farming in the Blue-grass region of Kentucky. Kentucky Agricultural Experiment Station Bulletin 210.

ARNOLD, J. H. (1918). A study of farming in southwestern Kentucky. U. S. Department of Agriculture Bulletin 713.

NICHOLLS, W. D., and HUTSON, J. B. (1918). Profitable dairy farm organization in Kentucky. Kentucky Agricultural Experiment Station Bulletin 217.

WEST NORTH CENTRAL STATES.

JOHNSON, O. R., and FOARD, W. E. (1914). Land tenure. Missouri Agricultural Experiment Station Bulletin 121.

LLOYD, O. G. (1915). Farm leases in Iowa. Iowa Agricultural Experiment Station Bulletin 159, pages 157-206.

- JOHNSON, O. R., and FOARD, W. E. (1916). Size of farm business. Missouri Agricultural Experiment Station Bulletin 140.
- FILLEY, H. C. (1916). Farm management studies in eastern Nebraska. Nebraska Agricultural Experiment Station Bulletin 157.
- BOSS, ANDREW, BENTON, A. H., and CAVERT, W. I. (1917). A farm management study in southeastern Minnesota; factors influencing profits. Minnesota Agricultural Experiment Station Bulletin 172.
- SPILLMAN, W. J. (1917). Factors of successful farming near Monett, Mo. U. S. Department of Agriculture Bulletin 633.

WEST SOUTH CENTRAL STATES.

- WILLARD, REX E. (1918). A farm management study of cotton farms of Ellis County, Texas. U. S. Department of Agriculture Bulletin 659.
- WILLARD, REX E. (1918). Status of farming in the lower Rio Grande irrigated district of Texas. U. S. Department of Agriculture Bulletin 665.

MOUNTAIN STATES.

- THOMSON, E. H., and DIXON, H. M. (1914). Profits in farming on irrigated areas in Utah Lake Valley. U. S. Department of Agriculture Bulletin 117.
- CURRIER, E. L. (1914). Farm management in the Gallatin Valley. Montana Agricultural Experiment Station Bulletin 97.
- CURRIER, E. L. (1914). Profits in farming in irrigated areas. Montana Agricultural Experiment Station Bulletin 111.
- CONNOR, L. G. (1918). Farm management and farm profits on irrigated land in the Provo area. (Utah Lake Valley.) U. S. Department of Agriculture Bulletin 582.
- CLOTHIER, R. W. (1918). Farm organization in the irrigated valleys of southern Arizona. U. S. Department of Agriculture Bulletin 654.